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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/681,894	06/21/2001	Roderick A. B. Devine	PRS075	2985

23425 7590 12/10/2001

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EXAMINER	
COLLINS, DEVEN M	
ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 12/10/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/681,894	Applicant(s) DEVINE ET AL.	
	Examiner D. M. Collins	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-12 are rejected under 35 U.S.C. 102(e) as being unpatentable over Warren et al. (6,159,829, dated 12/12/00).

Warren et al. show the method as claimed in the Figures 1-10 with corresponding text. In re claim 1, Warren et al. disclose a silicon-based semiconductor microcircuit 12 radiation hardening method comprised of:

heating the microcircuit 12 in a vacuum furnace to remove any hydrogen 16 in the microcircuit structure; and annealing the microcircuit 12 with deuterium containing forming gas.(col. 6, par. 2)

In re claim 2, Warren et al. disclose the radiation hardening method of claim 1 wherein the microcircuit 12 is heated in a vacuum for approximately 1 hour at between 400 and 700 degrees C. (col. 6, par. 4)

In re claim 3, Warren et al. disclose the radiation hardening method of claim 2 wherein the microcircuit 12 is heated in a vacuum of 10-6 torr or less.

In re claim 4, Warren et al. disclose the radiation hardening method of claim 3 wherein the microcircuit 12 is annealed in deuterium-containing forming gas for about 30 minutes at about 400 C. (col. 5, par. 4)

In re claim 5, Warren et al. disclose the radiation hardening method of claim 3 wherein the microcircuit 12 includes MOSFET devices 78.

In re claim 6, Warren et al. disclose the radiation hardening method of claim 3 wherein the microcircuit 12 includes EEPROM devices. (col. 1, par. 4)

In re claim 7, Warren et al. disclose a radiation hardened silicon-based semiconductor microcircuit 12 prepared by a process comprising the steps of:

fabricating the microcircuit 12 using standard techniques of silicon-based microelectronics (10, 14, 18, 20, 22) up to the step of passivation using a forming gas anneal; heating the microcircuit in a vacuum furnace to remove any hydrogen 16 in the microcircuit structure 12; and annealing the microcircuit 12 with deuterium containing forming gas. (col. 6, par. 2)

In re claim 8, Warren et al. disclose the radiation hardened semiconductor microcircuit of claim 7 wherein during the heating step, the microcircuit 12 is heated in a vacuum for approximately 1 hour at about 500 C. (col. 6, par. 4)

In re claim 9, Warren et al. disclose the radiation hardened semiconductor microcircuit of claim 8 wherein during the heating step, the microcircuit 12 is heated in a vacuum of 10-6 torr or less.

In re claim 10, Warren et al. disclose the radiation hardened semiconductor microcircuit of claim 9 wherein the microcircuit 12 is annealed in deuterium-containing forming gas for about 30 minutes at about 400 C. (col. 5, par. 4)

In re claim 11, Warren et al. disclose a radiation hardened silicon based semiconductor microcircuit 12 prepared by a process comprising the steps of:

fabricating the microcircuit 12 using standard techniques of silicon-based microelectronics up to the step of passivation using a forming gas anneal; and annealing the microcircuit with deuterium-containing forming gas. (col. 6, par.4)

In re claim 12, Warren et al. disclose a radiation hardened silicon based semiconductor microcircuit 12 prepared by a process comprised of fabricating the microcircuit using standard techniques of silicon-based microelectronics except that the deuterium is substituted for hydrogen 16 in any fabrication step that involves hydrogen gas or hydrogen-containing species.

(col. 6, par. 2)

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Deven M. Collins whose telephone number is (703) 305-7840. The examiner can normally be reached on Monday-Friday from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy, can be reached on (703) 308-4918. The fax phone number for this Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

DMC

December 3, 2001

WAEL FAHMY
SPE 2823